SKILLS CHECK

QUESTION 1

Express $\frac{3\sqrt{3}-2}{2-\sqrt{3}}$ in the form $a + b\sqrt{3}$ where a and b are constants

QUESTION 2

Find the coefficient of the x^4 term in the expansion of $(2x - 1)^6$

QUESTION 3

Show that $\int_1^2 \frac{1}{\sqrt{x}}\, dx = k(\sqrt{2} - 1)$

QUESTION 4

Prove that y = 2x is a tangent to the curve $y = 4x - x^2 - 1$ and find the coordinates of the point of contact

QUESTION 5

State the axis intercepts, in exact form for the curve $y = 12e^x - 4e^{2x}$

WEEK 1

SKILLS CHECK

QUESTION 1

A circle of radius 5 passes through the points (0 , 0) and (8, 0). Find the two possible centres of the circle.

QUESTION 2

Solve the equation $\sin(2\theta) + 2 = 2cos^2(2\theta)$ for $0° \leq x \leq 180°$

QUESTION 3

The graph of $y = ax^3 - 3x + c$ has a gradient of 45 at point (2, 15).
Find the values of a and c

QUESTION 4

Given that f(1) = 0 where $f(x) = 2x^3 - 5x^2 - 6x + 9$, express f(x) as the product of 3 linear factors

QUESTION 5

The graph of $y = x^3$ is translated by $\begin{bmatrix} -1 \\ 3 \end{bmatrix}$. Find the equation of the resulting graph in the form $y = ax^3 + bx^2 + cx + d$

WEEK 2

SKILLS CHECK

QUESTION 1

Evaluate $\int_1^2 \frac{x^2+2x+1}{x^4}\ dx$

QUESTION 2

Express $8x^2 + 4x + 3$ in the form $a(x + b)^2 + c$

QUESTION 3

Show using differentiation from first principles that the derivative of $8x^3$ is $24x^2$

QUESTION 4

Given that $\frac{dy}{dx} = \frac{1}{x^2} - \frac{2}{x^3}$ and when x =-1, y = 6, express y in terms of x

QUESTION 5

Solve $4^{(2x+1)} = \frac{1}{2^x}$

WEEK 3

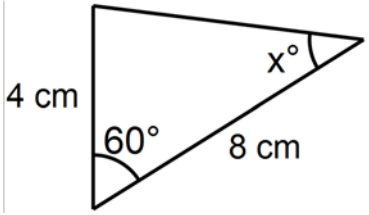
SKILLS CHECK

QUESTION 1

Show that the equation $x^2 + (k + 4)x + k = 0$ has 2 real and distinct roots for all values of k

QUESTION 2

Find the value of sin x



QUESTION 3

Evaluate $\int_1^4 3\sqrt{x} + 2x \, dx$

QUESTION 4

Find the equation of the tangent to the curve $y = x^2(1 – x)$ at the point where x = ½

QUESTION 5

Describe the transformation which transforms the graph of $y = 3^x$ to the graph of $y = 3^{x-2} + 1$

SKILLS CHECK

QUESTION 1

Given that $\int_a^{2a}(5-3x)dx = \frac{1}{2}$ find the possible values of a

QUESTION 2

Find the set of values of x for which $y = x^3 - 4x^2 - 35x + 6$ is a decreasing function

QUESTION 3

Solve $\sqrt{3}\sin(2\theta - 20°) = 3\cos(2\theta - 20°)$

QUESTION 4

The line joining A(2,0) and B(8,8) is the diameter of a circle. Find the equation of the tangent to the circle at point B in the form ax + by = c

QUESTION 5

Find the first three terms in the expansion of $(2 - \frac{1}{4}x)^8$

SKILLS CHECK

QUESTION 1

The equation $kx^2 + 4kx - 3 = 0$ has 2 real and distinct roots.
Find the range of values of k

QUESTION 2

A has position vector 2i – 5j and B has position vector 6i + 3j
Find |AB|

QUESTION 3

Solve $5 - 2cos3\theta = 8sin^2 3\theta$ for $0° \leq \theta \leq 180°$

QUESTION 4

Solve $2e^x + 3 = \frac{2}{e^x}$

QUESTION 5

$f(x) = ax^3 - x^2 - bx + 6$
Given that f(1) = 0 and f(-2) = 0 find the values of a and b

SKILLS CHECK

QUESTION 1

Solve $24x^2 - 4x > 5$

QUESTION 2

Express $\frac{3\sqrt{2}-1}{\sqrt{2}-1}$ in the form $a + b\sqrt{2}$

QUESTION 3

Find the first four terms in the expansion of $(1 - 2x)^{10}$

QUESTION 4

Find the equation of the tangent to the curve $y = 3x\sqrt{x} + \frac{16}{x}$ at the point where x = 4

QUESTION 5

Find the unit vector parallel to the vector $20i - 21j$

WEEK 7